

## PATENT ABSTRACTS OF JAPAN

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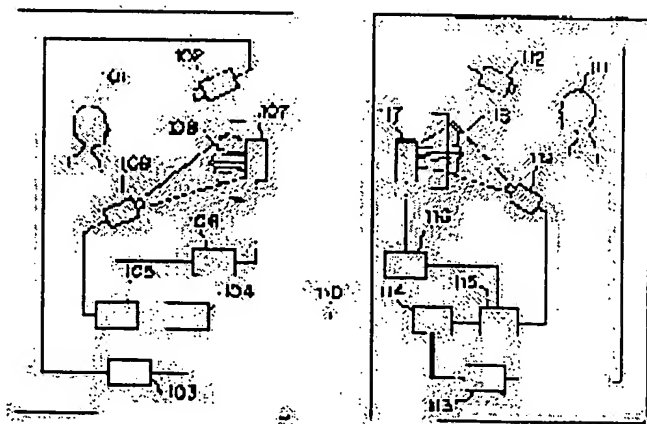
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|--------------------------|------------|-----------------|-----------------------------------|
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| (22)Date of filing :     | 12.07.1991 | (72)Inventor :  | OKIMURA YOSHIMI<br>SASAMA HIROSHI |

(54) STEREOSCOPIC PICTURE DISPLAY UNIT

(57)Abstract:

**PURPOSE:** To improve the stereoscopic picture display effect by changing the screen shape prepared stereographically and timely in conformity with the three-dimensional shape of an image to be displayed.

CONSTITUTION: This stereoscopic picture display unit is provided with a shape changing screen 118 whose shape varies in conformity with given three-dimensional shape data, an analyzer 115 for transforming two-dimensional image data sent from transmission circuit 110 into three-dimensional shape modelling data, and a shape changing controller 117 or providing the screen 118 with three-dimensional shape data based on data from the analyzer 115. Further, base on two-dimensional image data to be displayed, three-dimensional shape data is constituted on the screen surface, and a three-dimensional shape is displayed on the screen based on the constitution.



## LEGAL STATUS

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[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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**CLAIMS**

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[Claim(s)]

[Claim 1] The solid graphic display device characterized by to have the configuration adjustable screen from which a configuration changes according to the given three-dimension configuration data, a configuration means constitute three-dimension geometric-modeling data from two-dimensional image information which it is going to display, the configuration adjustable control unit which give the three-dimension configuration data based on the three-dimension geometric-modeling data constituted by this configuration means to said configuration adjustable screen, and image projection equipment which project said two-dimensional image information on said configuration adjustable screen.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to a solid graphic display device.

[0002]

[Summary of the Invention] This invention is the solid graphic display device which enabled it to correspond also to a dynamic image by moving the solid configuration on the screen according to a motion of a body while reproducing the solid configuration of the body in an image correctly on a screen in arbitrary forms.

[0003]

[Description of the Prior Art] It can classify into two approaches, the stereoscopic vision mold which shows a two-dimensional screen in three dimensions as the technique of displaying the image from the former in three dimensions, and stereoscopic model mold [ which creates the image which actually had three-dimension-breadth ] \*\*. By the stereoscopic vision method, as shown in drawing 2 , the sight 201 which it is going to photo is photoed with the video camera 202 for left eyes, and the video camera 203 for right eyes. The two images 204,205 are transmitted by each transmission line 206,207. It projects on one screen 213 using the projector 208 which copies the image for left eyes for the two images, and the projector 209 which copies the image for right eyes. The signal from two projectors 208,209 is given to the right-and-left image decollator 211 through the right-and-left image separation control unit 210, and it had to be made for the image 204,205 on either side to have had to look independent to the eye of right and left of an observer 212 with this equipment 211.

[0004] Moreover, the example in a solid method of image is explained using drawing 3. People's face to display is copied on the mask 301 of plastics, it attaches in the front face of a profile projector 302, and the video image of people's face to display is projected from behind.

[0005]

[Problem(s) to be Solved by the Invention] In the case of the former, there were troubles, such as becoming the point which can display only the image from an one direction theoretically, and the image which there is a problem of the parallax both the observer's eyes since it is a flat-surface image, and produces sensuous conflict, and is very much hard to see.

[0006] Moreover, the mask of plastics had to be exchanged, whenever in the case of the latter it prepared two or more displays or the speaker changed, when a participant was plurality. Thus, since the solid

configuration used as a screen was being fixed like a specific person's face, one screen had the trouble that it could respond only to one image.

[0007] Therefore, it was completely impossible to have displayed another image. Moreover, a dynamic image was not able to be displayed even if it was the same image.

[0008] Therefore, the purpose of this invention is to offer the solid graphic display device which solved the above troubles.

[0009]

[Means for Solving the Problem] It is characterized by to have the configuration adjustable screen from which a configuration changes according to the three-dimension configuration data with which this invention was given, a configuration means constitute three-dimension geometric-modeling data from two-dimensional image information which is going to display, the configuration adjustable control unit which give the three-dimension configuration data based on the three-dimension geometric-modeling data constituted by this configuration means to said configuration adjustable screen, and image projection equipment which project said two-dimensional image information on said configuration adjustable screen, in order to attain the above-mentioned purpose.

[0010]

[Function] According to this invention, by constituting the three-dimension configuration data of a screen side based on the two-dimensional image data which should be projected, even if it forms the three-dimension solid configuration based on this three-dimension configuration data on a screen and an image changes, even if an image moves, the three-dimension solid configuration on a screen follows in footsteps of it, and a three dimensional display is realized again.

[0011]

[Example] Hereafter, the example of this invention is explained to a detail with reference to a drawing.

[0012] In a stereoscopic-television telephone system as shown in drawing 1, a speaker's 101-111 face is photoed using a television camera 102-112, it is transmitted to the other party using the propagation circuits 110, such as the telephone line, and the example which realizes a stereoscopic-television telephone system using the configuration adjustable control unit 107-117, configuration adjustable screen equipment 108-118, and image projection equipment 109-119 is explained. For 103-113, as for a transmission control unit and 105-115, image coding equipment and 104-114 are [ a three-dimension geometric-modeling analysis apparatus and 106-116 ] synchronizers.

[0013] The speaker 101 who is present in Office A, and the speaker 111 who is present in Office B are going to talk using a telephone. A speaker's 101 face image is photoed with a television camera 102. And it is changed into digital information by image coding equipment 103, is changed into the signal which can be transmitted by the propagation circuit 110 with a transmission control unit 104, and is transmitted to the office B in which a speaker 111 is present using a propagation circuit 110.

[0014] Then, the signal transmitted by the propagation circuit 110 is restored to two-dimensional image information by the transmission control unit 114, the three-dimension geometric-modeling data in an image are constituted by the three-dimension geometric-modeling analysis apparatus 115, and it is sent to the synchronizer 116 with a speaker's 101 face image, and is further sent to the configuration adjustable control device 117 from this equipment 116, and this equipment 117 controls the configuration of the configuration adjustable screen 118 by it based on the inputted data. Three-dimension geometric-modeling equipment 115 has the image data file which stores two-dimensional image information and the three-dimension geometric-modeling data of this image. Moreover, the two-

dimensional picture signal which came out of three-dimension geometric-modeling equipment 115 is sent to image projection equipment 119, and a speaker's 101 face image is projected on the configuration adjustable screen 118 by this equipment 119.

[0015] Since a series of above activities can be done at a video signal rate, they can follow in footsteps of a motion [ a speaker's face ], and can change the configuration of the configuration adjustable screen 118.

[0016] Therefore, a stereoscopic-television telephone with presence is realized. In addition, it is the same as that of the above also about the display in Office A.

[0017]  
[Effect of the Invention] By operation of this invention, with the conventional technique, an unrealizable real three dimensional display becomes possible, and can display in three dimensions now easily.

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[Translation done.]

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**TECHNICAL FIELD**

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[Industrial Application] This invention relates to a solid graphic display device.

[0002]

[Summary of the Invention] This invention is the solid graphic display device which enabled it to correspond also to a dynamic image by moving the solid configuration on the screen according to a motion of a body while reproducing the solid configuration of the body in an image correctly on a screen in arbitrary forms.

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**PRIOR ART**

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[0004] Moreover, the example in a solid method of image is explained using drawing 3. People's face to display is copied on the mask 301 of plastics, it attaches in the front face of a profile projector 302, and the video image of people's face to display is projected from behind.

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EFFECT OF THE INVENTION

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[Effect of the Invention] By operation of this invention, with the conventional technique, an unrealizable real three dimensional display becomes possible, and can display in three dimensions now easily.

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**TECHNICAL PROBLEM**

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[Problem(s) to be Solved by the Invention] In the case of the former, there were troubles, such as becoming the point which can display only the image from an one direction theoretically, and the image which there is a problem of the parallax both the observer's eyes since it is a flat-surface image, and produces sensuous conflict, and is very much hard to see.

[0006] Moreover, the mask of plastics had to be exchanged, whenever in the case of the latter it prepared two or more displays or the speaker changed, when a participant was plurality. Thus, since the solid configuration used as a screen was being fixed like a specific person's face, one screen had the trouble that it could respond only to one image.

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MEANS

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[Means for Solving the Problem] It is characterized by to have the configuration adjustable screen from which a configuration changes according to the three-dimension configuration data with which this invention was given, a configuration means constitute three-dimension geometric-modeling data from two-dimensional image information which is going to display, the configuration adjustable control unit which give the three-dimension configuration data based on the three-dimension geometric-modeling data constituted by this configuration means to said configuration adjustable screen, and image projection equipment which project said two-dimensional image information on said configuration adjustable screen, in order to attain the above-mentioned purpose.

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**OPERATION**

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[Function] According to this invention, by constituting the three-dimension configuration data of a screen side based on the two-dimensional image data which should be projected, even if it forms the three-dimension solid configuration based on this three-dimension configuration data on a screen and an image changes, even if an image moves, the three-dimension solid configuration on a screen follows in footsteps of it, and a three dimensional display is realized again.

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**EXAMPLE**

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[0012] In a stereoscopic-television telephone system as shown in drawing 1, a speaker's 101-111 face is photoed using a television camera 102-112, it is transmitted to the other party using the propagation circuits 110, such as the telephone line, and the example which realizes a stereoscopic-television telephone system using the configuration adjustable control unit 107-117, configuration adjustable screen equipment 108-118, and image projection equipment 109-119 is explained. For 103-113, as for a transmission control unit and 105-115, image coding equipment and 104-114 are [ a three-dimension geometric-modeling analysis apparatus and 106-116 ] synchronizers.

[0013] The speaker 101 who is present in Office A, and the speaker 111 who is present in Office B are going to talk using a telephone. A speaker's 101 face image is photoed with a television camera 102. And it is changed into digital information by image coding equipment 103, is changed into the signal which can be transmitted by the propagation circuit 110 with a transmission control unit 104, and is transmitted to the office B in which a speaker 111 is present using a propagation circuit 110.

[0014] Then, the signal transmitted by the propagation circuit 110 is restored to two-dimensional image information by the transmission control unit 114, the three-dimension geometric-modeling data in an image are constituted by the three-dimension geometric-modeling analysis apparatus 115, and it is sent to the synchronizer 116 with a speaker's 101 face image, and is further sent to the configuration adjustable control device 117 from this equipment 116, and this equipment 117 controls the configuration of the configuration adjustable screen 118 by it based on the inputted data. Three-dimension geometric-modeling equipment 115 has the image data file which stores two-dimensional image information and the three-dimension geometric-modeling data of this image. Moreover, the two-dimensional picture signal which came out of three-dimension geometric-modeling equipment 115 is sent to image projection equipment 119, and a speaker's 101 face image is projected on the configuration adjustable screen 118 by this equipment 119.

[0015] Since a series of above activities can be done at a video signal rate, they can follow in footsteps of a motion [ a speaker's face ], and can change the configuration of the configuration adjustable screen 118.

[0016] Therefore, a stereoscopic-television telephone with presence is realized. In addition, it is the same as that of the above also about the display in Office A.

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**DESCRIPTION OF DRAWINGS**

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[Brief Description of the Drawings]

[Drawing 1] It is the block diagram of this invention example.

[Drawing 2] It is drawing explaining an example of the solid image projection equipment by the stereoscopic vision method in the conventional technique.

[Drawing 3] It is drawing explaining an example of the solid image projection equipment by the solid method of image in the conventional technique.

[Description of Notations]

- 101 Speaker A
- 102 Television Camera
- 103 Image Coding Equipment
- 104 Transmission Control Unit
- 105 Three-Dimension Geometric-Modeling Analysis Apparatus
- 106 Synchronizer
- 107 Configuration Adjustable Control Unit
- 108 Configuration Adjustable Screen
- 109 Image Projection Equipment
- 110 Propagation Circuit
- 111 Speaker B
- 112 Television Camera
- 113 Image Coding / Restoration Equipment
- 114 Transmission Control Unit
- 115 Three-Dimension Geometric-Modeling Analysis Apparatus
- 116 Synchronizer
- 117 Configuration Adjustable Control Unit
- 118 Configuration Adjustable Screen
- 119 Image Projection Equipment
- 201 Sight
- 202 Video Camera for Left Eyes
- 203 Video Camera for Right Eyes
- 204 Image for Left Eyes

205 Image for Right Eyes  
206 Transmission Line for Left Eyes  
207 Transmission Line for Right Eyes  
208 Projector for Left Eyes  
209 Projector for Right Eyes  
210 Right-and-Left Image Separation Control Unit  
211 Right-and-Left Image Decollator  
212 Observer  
301 Mask  
302 Profile Projector

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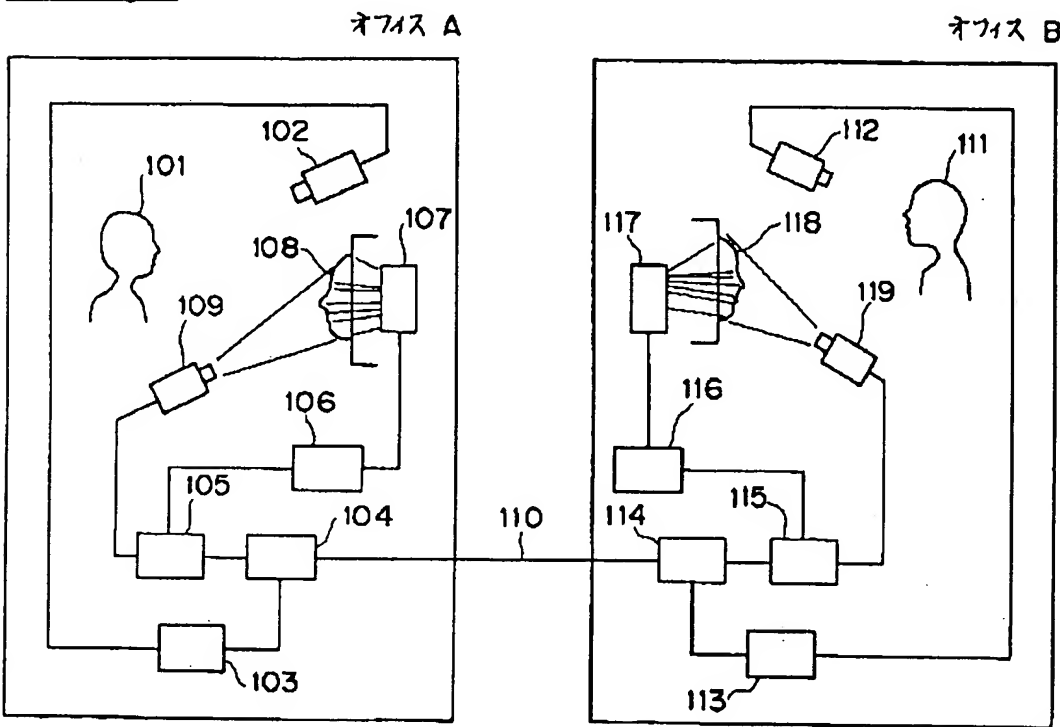
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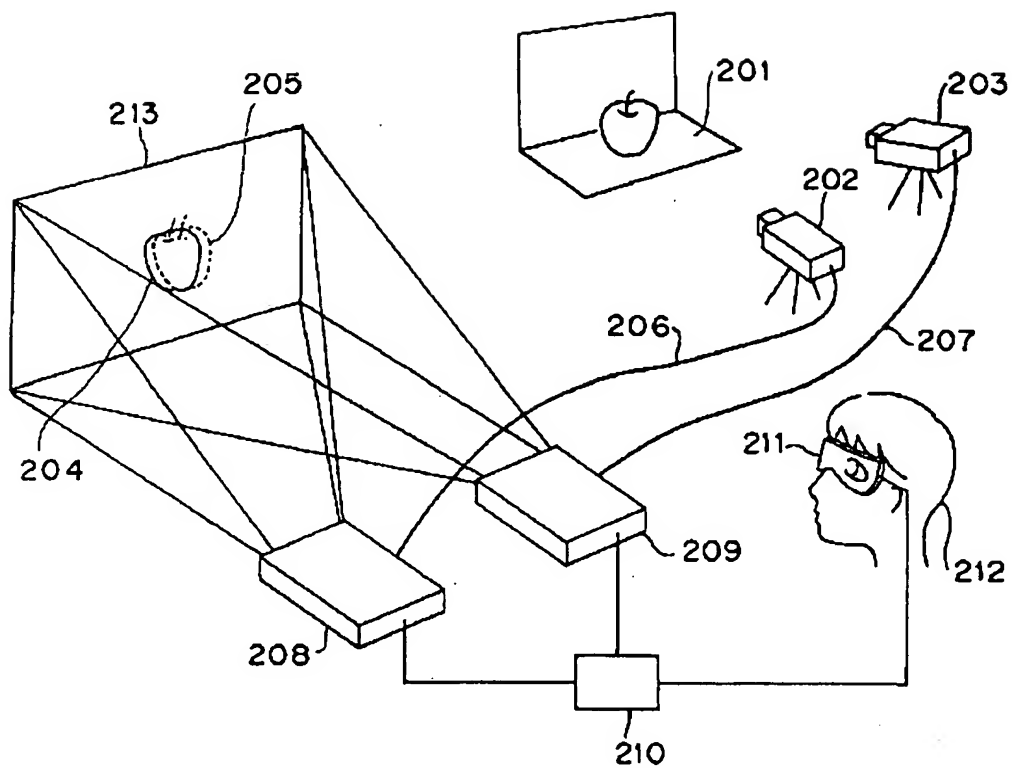
DRAWINGS

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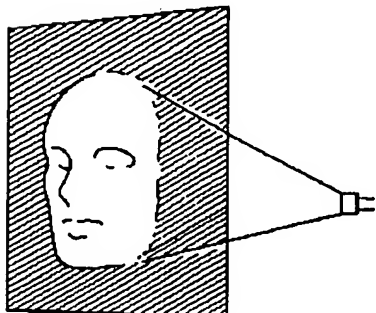
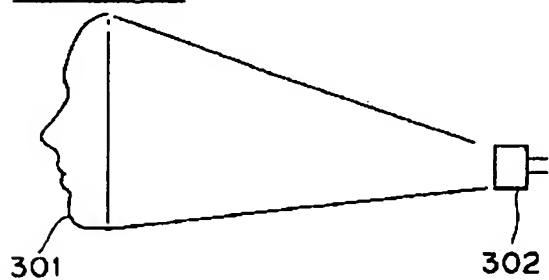
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Translation done.]